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From the disintegration of these various rocks we would naturally expect to find a soil containing in a small range the necessary conditions for a marked and characteristic flora. Nor are we disappointed in this, since the flora of this range is one of the most distinct and interesting in the state. Plants are found growing here whose range is much farther south. These hills are justly ranked as being among the finest fruit growing regions of the west, possessing good exposure and being remarkably free from frosts, which, in the valleys below, prevent the successful cultivation of such luxuries. Throughout this whole region we find extensive and productive peach orchards, returning to their owners an almost certain crop. Everything goes to show that for a long time "these knobs have been protected by their peculiar structure from the effects of sudden "cold snaps," for on such high knolls, chestnut trees three to four feet in diameter are growing, vigorous and fruitful. These trees cannot bear fruit, can hardly live in the cold temperature of the valleys." In the fifth annual report of the Indiana State Geological Survey the following species are given as representing the most important timber of these hills in Clarke and Floyd counties: *Quercus monticola*, *Q. alba*, *Q. rubra*, *Q. tinctoria*, *Q. obtusifolia*, *Pinus mitis*, *Carya amara*, *C. alba*, *Cornus florida*, *Liriodendron Tulipifera*, *Acer rubrum*, *Nyssa multiflora* and *Rhus aromatica*. This list could doubtless be much increased were a careful study given to the subject. Especially in the oaks would this be true, the hills giving the exact conditions for *Q. ilicifolia* and *Q. falcata*.

The *Ericads* are few and far between over the most of Indiana and, in fact, over the whole of this great interior basin. But these hills seem to supply the exact conditions necessary for their growth. We find *Vaccinium stamineum*, *V. vacillans*, *Epigaea repens*, *Oxydendrum arboreum*, *Kalmia latifolia*, *K. angustifolia*, several species of *Pyrola*, *Chimaphila maculata* and *umbellata*, *Monotropa uniflora* and *Hypopitys*, and several others that I do not recall. *Agave Virginica* is found in considerable abundance, and *Iris cristata* and *verna*. Among the *Liliaceous* plants are found several *Trilliums*, *Medeola Virginica*, *Melanthium Virginicum*, *Stenanthium angustifolium*, *Amianthum muscatoxicum*, *Chamaelirium luteum*, *Prosartes lanuginosa*, and several others. A collection of plants from the knobs has just been received but not studied. The species given above are those that caught my eye in a very cursory examination. Careful study will doubtless reveal many plants more interesting than any mentioned and disclose a flora of small range, around which can be drawn sharp and well defined boundary lines.

THE FOREST TREES OF CASS COUNTY, IND.—The character of the soil in this county, as we might expect, gives, to a certain extent, character to its forests. Originally low and swampy, when redeemed by drainage the soil is found to be a rich black loam. Instead of the great preponderance of Beech (*Fagus ferruginea*, Ait.), to be observed in the southern counties of the state, we find the *Querci* to be the most abundant. From a somewhat hurried examination of the forests, I should say that the different species of this genus comprised at least 50 per cent. of the entire forests; *Fagus ferruginea*, Ait., about 10 per cent.; Black Walnut (*Juglans nigra*, L. about 10 per cent.; Shag-bark Hickory (*Carya alba*, Nutt.), and the Tulip-tree (*Liriodendron Tulipifera*, L.), each about 5 per cent., the remainder being made up in greater or less quantities of the ordinary forest trees of the west. The oaks, excelling so largely in numbers, constitute of course the chief point of interest in the study of the forests. I have noted of this genus the following species: *Q. alba*, L., *Q. bicolor*, Willd., *Q. Prinus*, L., var. *acuminata*, Mx., *Q. coccinea*, Wang., *Q. rubra*, L., and *Q. palustris*, Du Roi. I think also that I have found *Q. ilicifolia*, Wang., although of this I am not certain, as according to Gray it grows in sandy barrens and rocky hills. These conditions are certainly lacking in this county, and yet I have a specimen that looks strangely like *Q. ilicifolia*. I was somewhat surprised to find *Q. falcata*, Mchx. missing, although perhaps the character of the

soil may account for its absence. The trees of the county in size compare favorably with those of other counties I have examined. *Fagus ferruginea*, *Liriodendron Tulipifera*, and *Platanus occidentalis* do not attain the size here that they do in the more southern counties. But on the other hand the *Querci* far exceed their kinsmen, here becoming true monarchs of the forest. I have had no opportunities for extended measurements, yet I have on my list two of this genus with a diameter exceeding 7 feet, two exceeding 6 feet and seventeen exceeding 5 feet. A striking feature to my mind is the young growth of *Juglans nigra*, L., which of late years is springing up every where. I have not found a single instance in which it has been cultivated and yet in one case I counted in a forest not exceeding 10 acres in area, 165 representatives of this species, from 6 to 12 inches in diameter. I have noticed the same fact in Grant county. This seems a strange fact, the more so since the older growth where it occurs contains but few individuals, nor do the stumps indicate that it ever had any great predominance. I would like to know whether this has been noted in any other locality.—M. S. COULTER, *Logansport, Ind.*

THE OAKS OF THE UNITED STATES. BY DR. GEORGE ENGELMANN.—In this pamphlet of twenty pages read before the Academy of Science of St. Louis, March 20, 1876, Dr. Engelmann, in his usual happy style, has let a flood of light upon a very dark and perplexing genus. The Oaks, with their endless forms, have long been a puzzle and it should be a great relief to amateurs when a botanist of such acknowledged keenness of observation takes hold of the subject, and while guiding us to some extent in the straight, clear path through these intricacies, at the same time acknowledges the difficulties in the way. The author first calls attention to the "striking example of the deceptive polymorphism" of western oaks furnished by the common Rocky Mountain scrub-oak. No fewer than 4 or 5 species have been founded upon the different forms of this scrub-oak. "In herbarium specimens they all appear distinct enough, but, looking around us the very abundance of material must shake our confidence in our discrimination: within the compass of a few hundred yards we find not only the forms above distinguished, but numbers of others which are neither the one nor the other, but which are intermediate between them and clearly unite them all as forms of one single extremely polymorphous species. If one oak behaves thus, why not others? Thrown into a sea of doubt, what can guide us to a correct knowledge?" The author then takes up in detail the various features that are of use in determining the groups and species. He considers the trunk—its bark as well as its wood—and remarks that the "popular distinction of 'White-oaks' and 'Black-oaks' is based on correct observation." The leaves are then considered, principally as to their veneration and the author states it as his belief "that the characters of veneration will not only help to distinguish allied species or doubtful varieties, but will also assist in unravelling the intricate questions of hybridity." The male flowers, female flowers and fruit are spoken of in turn with their importance for furnishing valuable characters to distinguish the groups and species. In conclusion the author observes that our oaks, leaving out the very peculiar Californian *Q. densiflora*, "arrange themselves into two great groups, alluded to above as the White-oaks and Black-oaks.

The *White-oaks* are characterized by paler, often scaly bark, tougher and denser wood, and sessile or subsessile stigmas, and bear the abortive ovules at the base or rarely on the side of the perfect seed. Besides this, the leaves and their lobes or teeth are obtuse, never bristle-pointed, though sometimes spinous-tipped; their stamens are more numerous, the scales of the cup more or less knobby at base, the inner surface of the nut glabrous or (rarely) pubescent; the fruit generally matures in the first year.

The *Black-oaks* have dark, furrowed bark, brittle and porous wood, styles long and spreading or recurved, abortive ovules always near the tip of the perfect seed. The leaves and their lobes are bristle-pointed, at least in youth; lobes and teeth